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the first knitted conductive textile layer **1502** and the aperture windows of the intermediate separating layer **1504**. Courses of first knitted conductive textile layer **1502** extend in a second direction that is orthogonal to the first direction indicated by arrow **1505**. Intermediate separating layer **1504** has a second aperture window dimension SAWD that is the distance across an aperture window measured in this second direction. According to the second dimensional relationship, the course pitch dimension CPD of first knitted conductive textile layer **1502** is smaller than the second aperture window dimension SAWD of intermediate separating layer **1504**.

Thus, a sensor may feature a looping portion footprint LPF of a first knitted conductive textile layer that is wholly containable within an aperture footprint AF or aperture window footprint AWF of an intermediate separating layer. In addition to or in the alternative, a sensor may feature a stitch pitch dimension of a first knitted conductive textile layer measured in a first direction that is smaller than either a first aperture dimension FAD or a first aperture window dimension FAWD measured in the same first direction.

FIG. 16

FIG. 16 shows sensor **1401** of FIG. 14 responding to manually applied pressure. A finger **1601** is shown pressing the first knitted conductive textile layer **1402** at a location between two supporting portions **1602**, **1603** of the intermediate separating layer **1404**. It can be seen that the first knitted conductive textile layer **1402** deforms under this mechanical interaction such that several stitches collapse into the aperture of the intermediate separating layer **1404** towards the second conductive textile layer **1403** to make electrical contact.

The incorporation into a sensor of at least one of the dimensional relationships between a first knitted conductive textile layer and an intermediate separating layer previously described imparts to the sensor an improved uniformity of sensitivity. The provision of sufficient looping portions within a knitted conductive textile layer to provide loop-aperture or loop-aperture window alignment for each aperture or aperture window respectively of the intermediate separating layer provides for improved uniformity of collapse of the first knitted conductive textile layer across the sensor in response to applied pressure.

Referring back to FIG. 12, not all of the stitch looping portions of a conductive layer align with mesh apertures. This structural feature may introduce non-uniformity into the response of a sensor to applied pressure.

It is preferable to align the first knitted conductive textile plane or layer with the intermediate separating plane or layer of the sensor to ensure an appropriate degree of loop-aperture alignment. This feature serves to provide a greater degree of consistency of sensor response. Alignment may be performed between two separate layers or two planes may be manufactured into a single layer or structure, the latter being advantageous since more precise alignment can be achieved by manufacturing the planes in accordance with a pattern designed to provide this quality. For example, the intermediate separating plane may be provided in the form of a textile structure and the intermediate separating plane and the first knitted conductive textile layer may be machined together to form a textile structure incorporating a predetermined loop-aperture window alignment pattern.

FIG. 17

FIG. 17 shows a cross-section through a sensor **1701** constructed from three layers only; a first knitted conductive textile layer **1702**, a second conductive textile layer **1703**

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and an intermediate separating layer **1704** disposed between the first and second conductive textile layer.

Intermediate separating layer **1702** is compliant in the direction indicated by arrow **1705** i.e. in the direction orthogonal to the plane of the sensor **1701**. Thus, as shown, when pressure is applied to bring first knitted conductive textile layer **1702** into contact with second conductive textile layer **1703**, supporting portions of the intermediate separating layer about the press location, for example supporting portion **1706**, undergo compression. This squeezing of the intermediate separating layer functions to reduce the distance between the planes of the outer layers **1702**, **1703**. However, the resilience of the mesh returns the gap between the conductive textile layers to the distance of that in the at rest condition of the sensor when the applied pressure is removed.

A compressible intermediate separating plane may be fabricated from a resilient material, such as elastomeric silicone polymer, having a hardness of 15-20 Shore A.

FIGS. 18A and 18B

A sensor may be provided with a force concentration device, to focus and localise the area of application of an applied force to thereby increase the pressure applied to the detector. The inclusion of a force concentration device allows a denser intermediate separating layer to be used. The combination of a force concentration device with a denser separating layer structure ensures that the detector is sufficiently sensitive to tactile mechanical interactions while at the same time it is substantially more resilient to false triggering caused by, for example flexing of the detector. The inclusion of a force concentration device may also allow a thicker intermediate separating layer to be used.

FIG. 18A and FIG. 18B each show a cross-section through a sensor **1801** constructed from three layers only; a first knitted conductive textile layer **1802**, a second conductive textile layer **1803** and an intermediate separating textile layer **1804** disposed between the first and second conductive textile layer. In addition, sensor **1801** is provided with an outer key layer **1805** defining key positions.

The key positions of the key layer **1805** include an upper portion **1806** having an upper surface **1807** and a lower surface **1808**. The upper surface **1807** supports the application of a finger and to assist in this operation, the upper surface **1807** optionally presents a slightly concave profile to the approaching finger.

A contact position **1808** extends from the lower surface **1808** to the upper portion **1806** and as such provides a force concentration device for localising the area of application of an applied force. FIG. 18A shows the key layer **1805** in the rest condition. When not under pressure, the contact portion **1809** is displaced from the position detector by a displacement of preferably 0.2 mm, as illustrated by arrow **1810**. In alternative embodiments, this distance may be changed to displacements of say, between zero and 0.8 mm. A displacement of between 0.1 and 0.3 mm is considered to be preferred.

Wall portions **1811** extend between support region **1812** and the upper portion **1806**. The wall portions under region **1812** of the upper portion surrounding the contact portion **1809** have a reduced thickness. The reduced thickness is provided so as to enhance collapsibility when a finger press is displaced from its preferred central location.

The effects of the key shown in FIG. 18A being pressed are illustrated in FIG. 18B. Finger pressure is applied in a direction identified by arrow **1813**, in this example this is offset from an optimum central position of the upper portion